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EXAMINER				
HUNG, YUBIN				
ART UNIT		PAPER NUMBER		
2624				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

09/945,295

Applicant(s)

PETTITT, GREGORY S.

Examiner

YUBIN HUNG

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 April 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 4-13, 16 and 18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 4-13, 16 and 18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 August 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/C)
- Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. In view of the appeal brief filed 04/22/08, PROSECUTION IS HEREBY REOPENED. A new ground of rejection is set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,

(2) initiate a new appeal by filing a notice of appeal under 37 CFR 41.31 followed by an appeal brief under 37 CFR 41.37. The previously paid notice of appeal fee and appeal brief fee can be applied to the new appeal. If, however, the appeal fees set forth in 37 CFR 41.20 have been increased since they were previously paid, then appellant must pay the difference between the increased fees and the amount previously paid.

A Supervisory Patent Examiner (SPE) has approved of reopening prosecution by signing below:

/Bhavesh Mehta/

SPE, TC 2600.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Oguchi et al. (US 6,340,976) and in view of Ohta et al. (US 5,917,939).

4. Regarding claim 1, Oguchi discloses

- Providing at least two projectors [Fig. 1, numerals 2 (projectors), 8 (Processing unit); Col. 5, lines 38-56. Note that each processing unit is considered part of the projector since they are coupled to each other]
- communicating each projector's chromaticity data and luminance data to a main controller [Fig. 1, refs 4 & 5 (considered a controller composing refs. 6 and 7); Figs. 2 & 3; Col. 5, lines 46-50; Col. 9, lines 6-23. Note that the chromaticity sensors send chromaticity data of their respective projector to a main controller. Note further that the data from the sensors are in represented in XYZ, which inherently embodies both color and luminance (e.g., can be converted into $L^*a^*b^*$ representation where L^* is the luminance component and a^* and b^* are the color components)]
- determining a standard color gamut achievable by each projector [Col. 3, lines 8-10; Col. 7, lines 41-60, especially lines 55-60. Note that the common color production region correspond to a standard gamut of the projectors]
- calculating color correction data for each projector based on that projector's chromaticity data, luminance data and on said standard color gamut [Col. 6, line 1 through Col. 8, line 40, especially Equations 1-10. Note that M_{in} corresponds to the color correction data of the n^{th} projector]
- calculating image pixel values based on input image data and said color correction data [Col. 2, lines 42-46 (each projector/processing unit calculates its own corrected pixels for display); Col. 8, lines 51-53]

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Oguchi does not expressly disclose that each projector has chromaticity data of and luminance data (relative luminance of colors) generated by that projector stored therein and that the luminance data is also communicated to the main controller to calculate color correction.

However, Ohta discloses storing device color reproduction range (considered a colorimetric profile) needed for producing accurate color in that device. [Col. 21, lines 7-25, especially lines 20-23. Note that the color reproduction range includes both color (the a^* and b^* components) and luminance (the L^* component) information, per Figs. 2-4 and Col. 5, line 46-Col. 6, line 29]

Oguchi and Ohta are combinable because they both have aspects that are from the same field of endeavor of color correction.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify Oguchi with the teachings of Ohta by storing information needed for color correction in that device (e.g., projector) to obtain the invention of claim 1. The reasons for doing so at least would have been to allow automated calculation of color correction data (because the controller can obtain chromaticity data from a projector it connects to directly, instead of having to have someone to enter it) and save cost (by not having to have, e.g., a separate set of chromaticity sensors to obtain such information).

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5. Claims 4, 10, 12, 13 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oguchi et al. (US 6,340,976) and Ohta et al. (US 5,917,939) as applied to claim 1 above, and further in view of DeMond et al. (US 5,079,544).

6. Regarding claim 4, the combined invention of Oguchi and Ohta discloses all limitations of its parent, claim 1.

The combined invention of Oguchi and Ohta does not expressly disclose the following, which DeMond teaches

- each said projectors include spatial light modulators at which light is directed from a light source through a rotating color wheel and wherein said stored luminance data for a projector represents effective light times of each color of a color wheel for that projector relative to a base wheel rate [Fig. 1a, refs. 10 (light source), 15 (spatial light modulator) and Col. 6, lines 42-68; Fig. 5c (color wheel) and Col. 14, lines 14-31. Note that for a projector using a light wheel and an SLM, its luminance represents the effective light times of each color. Note further that per the analysis of claim 1 luminance data is stored in each projector]

The combined invention of Oguchi and Ohta is combinable with DeMond because they both have aspects that are from the same field of endeavor of projection systems.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify the combined invention of Oguchi and Ohta with the teachings of DeMond as recited above to obtain the invention of claim 4. The reasons at least would have been to selectively redirect portions of light so as to form an image and to provide colors to

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the projection system, as DeMond indicates in Col. 6, lines 58-60 and Col. 14, lines 14-20, respectively.

7. Regarding claim 10, DeMond further discloses

- generating images at each projector, from the calculated image pixels, and using a spatial light modulator [Fig. 1a (image-generating projector) and Col. 6, lines 42-68. Note that per the analysis of claim 1 Oguchi discloses that image pixels to be displayed are calculated at each projector (see Oguchi: Col. 2, lines 42-46 (each projector/process calculates its own corrected pixels for display))]

8. Regarding claim 12, the combined invention of Oguchi, Ohta and DeMond further discloses

- at least two projectors, each operable to generate a portion of an image [Oguchi: Fig. 1, numerals 2 (projectors), 8 (Processing unit); Col. 5, lines 38-56. Note that each processing unit is considered part of the projector since they are coupled to each other]
- each projector comprising a spatial light modulator for generating its portion of the image responsive to each color component of pixel values and a memory for storing chromaticity data and luminance data for that projector [DeMond: Fig. 1a. See also the analyses of claim 1 regarding storing each projector's chromaticity data and luminance data (implying the existence of a memory) and claim 4 regarding the use of a spatial light modulator (along with a light source and a color wheel)]
- a main controller coupled to each projector to receive stored chromaticity and luminance data, have circuitry to generate color correction data and communicate corrected pixel value to the projector, the main controller comprising circuitry for generating color correction data for each projector based on the received chromaticity and luminance data, and for communicating the color correction data for each projector to that projector [Oguchi: Fig. 1, ref. 5 (the circuitry is considered the main controller composing refs. 6 and 7); Col. 5, lines 35-67 and Col. 6, line 1 through Col. 8, line 55, especially Equations 1-10 describes the calculation and communication of color correction data in details. See also the analysis for claim 1]
- wherein each projector further comprises circuitry for calculating corrected pixel values based on said color correction data [Oguchi: Fig. 1, refs. 2 & 8 (Note that each processing circuitry 8 is considered part of the projector 2 since they are coupled to each other); Col. 2, lines 42-46 (each projector/processing circuitry calculates its own corrected pixels for display); Col. 8, lines 51-53]

9. Regarding claim 13, note that DeMond further discloses a DMD [Fig. 1a, ref. 15 and Col. 6, lines 61-63; note that a deformable mirror device is also known as a digital

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micro-mirror device, see, for example, Col. 1, lines 31-33 of US. 5,612,753 to Poradish et al.], a light source [Fig. 1a, ref. 10] and a color wheel disposed as recited [Figs. 1a & 5c; Col. 14, lines 14-31]. (Note: the three devices collectively can be considered as a spatial light modulator.)

10. Claim 16 is similarly analyzed and rejected as per the analyses of claims 4 and 12.

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11. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Oguchi et al. (US 6,340,976) and Ohta et al. (US 5,917,939) as applied to claim 1 above, and further in view of Onuma et al. (US 5,287,173).

12. Regarding claim 5, the combined invention of Oguchi and Ohta discloses all limitations of its parent, claim 1.

The combined invention of Oguchi and Ohta does not expressly disclose the following, which Onuma teaches

- adjusting the gain of the color correction data based on the luminance data [Fig. 1, ref. 1; Fig. 2; Col. 2, lines 34-60; Col. 4, lines 26-41]

The combined invention of Oguchi and Ohta is combinable with Onuma because they both have aspects that are from the same field of endeavor of color correction.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify the combined invention of Oguchi and Ohta with the teachings of Onuma as recited above. The reasons at least would have been to be able to adjust the projected luminance so as to achieve a seamless tiled display.

Therefore, it would have been obvious to combine Onuma with Oguchi and Ohta to obtain the invention of claim 5.

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13. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Oguchi et al. (US 6,340,976) and Ohta et al. (US 5,917,939) as applied to claim 1 above, and further in view of Noguchi (US 6,101,272).

14. Regarding claim 6, the combined invention of Oguchi and Ohta discloses all the limitations of its parent, claim 1.

The combined invention of Oguchi and Ohta does not expressly disclose

- Wherein the communicating step comprises communicating each projector's chromaticity data is performed by communicating the data in the form of a transfer function matrix

However, Noguchi discloses performing gamut transformation and color correction (i.e., chromaticity data) using matrix operations [Col. 29, lines 39-44] and therefore teaches/suggests communicating the data in the form of a transfer function matrix.

The combined invention of Oguchi and Ohta is combinable with Noguchi because they both have aspects that are from the same field of endeavor of color correction.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify the combined invention of Oguchi and Ohta with the teachings of Noguchi by communicating the chromaticity data in the form of a transfer function matrix. The reasons at least would have been to be because it is a compact form to represent the data and matrix operations can be easily implemented.

Therefore, it would have been obvious to combine Noguchi with Ohta and Oguchi to obtain the invention of claim 6.

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15. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Oguchi et al. (US 6,340,976) and Ohta et al. (US 5,917,939) as applied to claim 1 above, and further in view of Yoshikuni (JP 02-001351, with English abstract).

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16. Regarding claim 7, the combined invention of Oguchi and Ohta discloses all the limitations of its parent, claim 1.

The combined invention of Oguchi and Ohta does not expressly disclose

- the chromaticity data is calculated from primary and white color values

However, Yoshikuni teaches performing color correction on primary and white colors

[English abstract: Constitution, lines 8-12]

The combined invention of Oguchi and Ohta is combinable with Yoshikuni because they both have aspects that are from the same field of endeavor of color correction.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify the combined invention of Oguchi and Ohta with the teachings of Yoshikuni by calculating chromaticity data from primary and white colors. The reasons at least would have been to be because the input has been in R, G, and B (primary colors) and that correcting white color can extend the dynamic range of the output device when producing a color near white.

Therefore, it would have been obvious to combine Yoshikuni with Ohta and Oguchi to obtain the invention of claim 7.

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17. Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oguchi et al. (US 6,340,976) and Ohta et al. (US 5,917,939) as applied to claim 1 above, and further in view of Appel (US 5,337,410).

18. Regarding claims 8 and 9, the combined invention of Oguchi and Ohta discloses all the limitations of their parent, claim 1.

The combined invention of Oguchi and Ohta does not expressly disclose

- (claim 8) said determining and calculating color correction data steps performed by at least one component selected from the group consisting of: a processing system in data communication with each other, and at least one projector functioning at least partially as the main controller
- (claim 9) said determining and calculating color correction data steps (are) performed by one of said projectors

However, Appel discloses a multi-processor system in which a processing unit also acts as a master (i.e., a controller, and note that in Oguchi the controller performs the determining and calculating steps) [Col. 2, lines 10-12].

The combined invention of Oguchi and Ohta is combinable with Appel because they have aspects that are from the same field of multi-processing.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify the combined invention of Oguchi and Ohta with the teachings of Appel by having one of the processing units act as the main controller. The reasons at least would have been to reduce the system cost.

Therefore, it would have been obvious to combine Appel with Oguchi and Ohta with to obtain the inventions of claims 8 and 9.

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19. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Oguchi et al. (US 6,340,976) and Ohta et al. (US 5,917,939) as applied to claim 1 above, and further in view of Gibson (US 5,253,043).

20. Regarding claim 11, the combined invention of Oguchi and Ohta discloses all the limitations of it parent, claim 1.

The combined invention of Oguchi and Ohta does not expressly teaches/suggests calculating color correction data from both primary and secondary colors. However, this limitation is taught by Gibson [Fig. 1; numeral 51; Col. 7, lines 52-66].

The combined invention of Oguchi and Ohta is combinable with Gibson because they both have aspects that are from the same field of endeavor of color correction.

At the time of the invention it would have been obvious to one of ordinary skill in the art to modify the combined invention of Oguchi and Ohta with the teachings of Gibson by deriving color correction from both primary and secondary color. The reasons at least

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would have been to provide more accurate color correction so that better image can be obtained.

Therefore, it would have been obvious to combine Gibson with Oguchi and Ohta to obtain the invention of claim 11.

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21. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Oguchi et al. (US 6,340,976), Ohta et al. (US 5,917,939) and DeMond et al. (US 5,079,544) as applied to claims 4, 10, 12, 13 and 16 above, and further in view of Gibson (US 5,253,043).

22. Regarding claim 18, the combined invention of Oguchi, Ohta and DeMond discloses all limitations of it parent, claim 12.

The combined invention of Oguchi and Ohta does not expressly teaches/suggests deriving color correction data from both primary and secondary colors. However, this limitation is taught by Gibson [Fig. 1; numeral 51; Col. 7, lines 52-66].

The combined invention of Oguchi, Ohta and DeMond is combinable with Gibson because they both have aspects that are from the same field of endeavor of color correction.

At the time of the invention it would have been obvious to one of ordinary skill in the art to modify the combined invention of Oguchi, Ohta and DeMond with the teachings of Gibson by deriving color correction from both primary and secondary color. The reasons at least would have been to provide more accurate color correction so that better image can be obtained.

Therefore, it would have been obvious to combine Gibson with Oguchi, Ohta and DeMond to obtain the invention of claim 18.

Conclusion and Contact Information

23. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- Cappels, Sr. (US 5,512,961)
- Poradish et al. (US 5,612,753)
- Jones, Jr. et al. (US 5,986,721)
- Gale (US 5,412,186)
- Doany et al. (US 5,921,650)
- Kouyama et al (EP 774,871 A2)

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24. Any inquiry concerning this communication or earlier communications from the examiner should be directed to YUBIN HUNG whose telephone number is (571)272-7451. The examiner can normally be reached on 7:30 - 4:00. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew C. Bella can be reached on (571) 272-7778. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

25. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Yubin Hung
Primary Examiner
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July 1, 2008